DOCUMENT RESUME

ED 480 490 CG 032 692

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TITLE	WISC-III Freedom from Distractibility Index and Measures of Attention in Children.
PUB DATE	2003-08-00
NOTE	10p.; Paper presented at the Annual Conference of the American Psychological Association (111th, Toronto, ON, Canada, August 7-10, 2003).
PUB TYPE	Information Analyses (070) -- Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Achievement Tests; *Attention; Attention Deficit Disorders; *Children; Hyperactivity; Intermediate Grades; *Measures (Individuals); Memory
IDENTIFIERS	*Wechsler Intelligence Scale for Children III

ABSTRACT

The Freedom from Distractability Index (FFD) on the Wechsler Intelligence Scale for Children- Third Edition (WISC-III) is an index score comprised of the sum of the scores on the Arithmetic and Digit Span subsets. Although the FFD is often interpreted as a measure of attention and concentration, there are a number of other possible explanations for performance in this scale, including anxiety, number facility, auditory short-term memory, and working memory. Comparisons were made across ADHD and non-ADHD groups of children on several measures used to assess attention in children between the ages of 9-15. Results indicated the FFD index shares greater variance with measures of achievement than of attention or memory. Additionally, correlations with measures of attention were low, with the exception of the CMS Attention/Concentration scale. (Contains 15 references and 1 table.) (Author)

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ED 480 490

WISC-III Freedom from Distractibility Index and Measures of Attention in Children

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Poster presented at the 111th annual Convention

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Toronto, Ontario, Canada

August 2003

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ABSTRACT

The Freedom from Distractibility Index (FFD) on the Wechsler Intelligence Scale for Children- Third Edition (WISC-III) is an index score comprised of the sum of the scores on the Arithmetic and Digit Span subtests. Although the FFD is often interpreted as a measure of attention and concentration, there are a number of other possible explanations for performance on this scale, including anxiety, number facility, auditory short-term memory, and working memory. Comparisons were made across ADHD and non-ADHD groups of children on several measures used to assess attention in children between the ages of 9-15. Results indicated the FFD index shares greater variance with measures of achievement than of attention or memory. Additionally, correlations with measures of attention were low, with the exception of the CMS Attention/Concentration scale.

INTRODUCTION

Children with ADHD have been found to perform more poorly on the FFD than non-ADHD peers (Golden, 1996; Lufi, Cohen, & Parish-Plass, 1990). However, diagnostic utility of the FFD has been increasingly questioned due to contradictory findings (Prifitera, Weiss, & Saklofske, 1998; Reinecke, Beebe, & Stein, 1999; Riccio, Cohen, Hall, & Ross, 1997). Possible explanations for poor performance on the FFD include anxiety, number facility, auditory short-term memory (Sattler, 1992), and working memory (Krane & Tannock, 2001).

Numerous clinical performance measures and rating scales are believed to measure children's attention and concentration, but many of them have demonstrated poor validity (DuPaul, Anastopoulos, Shelton, Guevremont, & Metevia, 1992). The Gordon Diagnostic System (GDS), Conners' Continuous Performance Test-II (CCPT-II), and the Attention/Concentration scale on the Children's Memory Scale (CMS) have been utilized to assess attention and disinhibition in children.

Research Questions

Does the FFD correlate with performance measures of attention, such as the GDS, CCPT-II, and the Attention/Concentration scale on the CMS?

Does the FFD correlate with parent and teacher rating scales of attention?

Are there group differences between these measures among children with and without ADHD?

METHOD

Participants

Participants were consecutive referrals to the Memory, Attention, and Planning Study (MAPS) at Texas A&M University. There were 53 children ages 9-15 (36 males; 17 females; *M* age = 11.63, *SD* = 2.11). Participants were grouped by ADHD (*N* = 32) and Non-ADHD diagnosis (*N* = 21). Parent education level ranged from 10th grade to graduate school (*M* = 15.10 years, *SD* = 2.39). Participants were asked to refrain from taking stimulant medication during the evaluation.

There were 27 males with ADHD, 9 males without ADHD, 12 females without ADHD, and 5 females with ADHD. Regarding the ethic breakdown of the sample, 77.4% of the children in the study were Caucasian, 11.3% were African American, and 11.3% were Hispanic.

Procedure

Children were administered a comprehensive evaluation of cognition, achievement, language, memory, executive function, attention, and behavior/emotional status. Diagnoses were made independently by two to three clinicians based on results of cognitive, achievement, and behavioral/emotional measures, various parent-report & teacher-report rating scales, direct observations, history of symptom onset, frequency, and duration.

Instruments

The WISC-III Freedom from Distractibility (FFD) Index is one of four indexes on the instrument often used to assess general intellectual functioning in children ages 6-16. The Conners' Continuous Performance Test-II (CCPT-II) and Gordon Diagnostic System

(GDS) are continuous performance tasks in which children are required to sustain attention to a specific task intended to be monotonous and tedious for an extended period of time in order to discern a child's ability to concentrate. The Attention/Concentration Scale on the Children's Memory Scale (CMS) is, like the FFD on the WISC-III, one of several indexes on the instrument that is assumed to measure children's general memory functioning. The FFD and Attention/Concentration Index share several subtests in common, namely the Numbers/Digit Span subtests.

The Behavior Assessment System for Children (BASC) - Parent Rating Scale (PRS) & Teacher Rating Scale (TRS) have been increasingly utilized omnibus measures in comprehensive evaluations of children's functioning as they have been demonstrated to be psychometrically sound and provide a wealth of information. Similarly, Conners' Rating Scale – Parent form (CPRS-R) & Teacher form (CTRS-R) are often used to assess children's attention and concentration abilities in addition to their levels of activity in the assessment of Attention-Deficit/Hyperactivity Disorder.

The Woodcock-Johnson Tests of Achievement – Third Edition (WJ-III) is comprised of a number of subtests measuring children's acquired skills in academic areas such as mathematics, reading, and written language.

RESULTS

Correlational Analyses

The FFD did not significantly correlate with GDS but it correlated with one variable on the CCPT – Omission Errors ($r = -.28$, $p \leq .05$). The FFD correlated with several scales on the CMS including the Attention/Concentration Scale ($r = .74$, $p \leq .01$),

General Memory ($r = .41$, $p \leq .01$), Verbal Immediate ($r = .34$, $p \leq .05$), Verbal Delayed ($r = .46$, $p \leq .01$), Visual Delayed ($r = .28$, $p \leq .05$), and Delayed Recognition ($r = .32$, $p \leq .05$).

Contrary to what was expected, the FFD did not significantly correlate with any of the scales on the CPRS-R, BASC-PRS, or BASC-SRP. However, it significantly correlated with CTRS-R Attention scale ($r = -.51$, $p \leq .05$) and several other teacher-rated scales. For example, on the BASC-TRS, the FFD was correlated with Learning Problems ($r = -.55$, $p \leq .01$), School Problems ($r = -.35$, $p \leq .05$), Study Skills ($r = .34$, $p \leq .01$) Anxiety ($r = -.40$, $p \leq .05$), and Withdrawal ($r = -.34$, $p \leq .05$).

Related Findings

Unexpectedly, the FFD correlated with all indices of achievement on the WJ-III. There were strong relationships observed on Broad Reading ($r = .59$, $p \leq .01$), Broad Math ($r = .64$, $p \leq .01$), Broad Writing ($r = .51$, $p \leq .01$), and Total Achievement ($r = .63$, $p \leq .01$).

Analysis of Variance

An analysis of variance was computed to discern how the two groups, ADHD and Non-ADHD, performed on the FFD. Results are presented in Table 1 and indicated that the groups did not significantly differ in their performance.

Table 1. *ANOVA results on the FFD*

Group	*M (SD)*	*F*	*p*	*ES*
ADHD *N*= 32	98.50 (13.82)	.90	.35	.017
Non-ADHD *N*= 21	102.29 (14.80)			

DISCUSSION

These preliminary findings suggest that the FFD index shares some variance with measures of attention, but the correlations are sufficiently low, with the exception of the CMS Attention/Concentration scale. In addition, the FFD should not be used as a substitute for CPTs or more comprehensive measures of attention and memory.

Moreover, the FFD index shares greater variance with measures of achievement than of attention or memory, and as such, may warrant further investigation with those children exhibiting academic difficulties. In conclusion, no single measure should ever be used for the assessment of ADHD, but these results indicate that in particular, the FFD is not supported as a measure of attention in children.

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